COVID-19 and the Foodways System: Analyzing Shifts in Digital Behavior

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COVID-19 has disrupted what we all knew as "normal," and the impact to business is far-reaching. In a recent analysis, we assessed the spread and peak of COVID-19 in the U.S. and the impact it has had specifically on the online environment across the foodways system, from production supply to direct-to-consumer delivery. While the U.S. is still in the first wave of COVID-19, our findings could be a leading indicator for businesses experiencing a lagged effect of the economic impact of the pandemic and what other companies could expect in a second wave.

COVID-19, ANIMAL PRODUCT PRODUCTION AND THE DIGITAL SPACE

The outbreak of the COVID-19 pandemic ushered in an unprecedented time marked by unique challenges and uncertainty for businesses. Although the impact certainly varies by industry, brands are asking the same fundamental questions: How is our business impacted? How do we respond? How do we shift operations to align with the needs and behavior of the consumer? How do we invest within the confines of economic uncertainty and loss? The way brands grapple with and answer these questions will inevitably influence their success throughout the pandemic and beyond. At Signal Theory, in an effort to provide data-driven insight for our clients, we set out to explore the signals consumers were sending through their digital behavior during this crisis.

We narrowed our focus to the foodways system because of our fascination with America's relationship to food and the growing concern surrounding the current system's ability to adapt to the supply chain disruption caused by COVID-19. Outbreaks of the disease within the meatpacking plants and subsequent closures led to a bottleneck in processing, packaging and distribution.[1,2] As a result, consumers experienced, and continue to experience, food shortages and rising prices at grocery stores.[3] At the same time, stay-at-home orders and restaurant closures led grocery spending to surge and

A summary of findings and implications:

- There is a positive relationship between COVID-19 cases in the U.S. and online activity for clients spanning the foodways system from production supply to direct-to-door consumer food products.

- Our findings support the hypothesis that the closer to the consumer's fridge a food product is, the more strongly we'd see web activity correlate with the events in the world around us.

- With these findings, there are a variety of considerations for brands as we move into the next phase of the pandemic:

  » *For brands that have a direct line to consumers, keep the barriers low and remain supportive and accessible.*

  » *For those that are supplying retailers and have a consumer following, make it as easy as possible for consumers to research products, understand supply and find what they need.*

  » *For those on the front end of the process, brace for the downstream impact of heightened demand and surplus supply.*

drove consumers to new, often digital, shopping channels.[4] In response to the increase in digital adoption referenced across industry and national news, we hypothesized that we would see a shift in digital traffic for our clients as a result of the new limitations and challenges brands are facing with their traditional distribution channels. Additionally, consumers have reported that their increased adoption of digital behavior brought on by COVID-19 will continue beyond the pandemic.[5] Armed with business questions, specific case studies within the foodways system and COVID-19 case data from Johns Hopkins University,[6] we began to explore consumer behavior in the era of COVID-19.

THE IMPACT ON DIGITAL ACTIVITY DIFFERS BASED ON THE DISTANCE BETWEEN PURCHASE-TO-FRIDGE

This particular exploration was focused on how our foodways system clients' digital traffic has been impacted by the pandemic. In selecting our client sample, we zeroed in on three sub-segments of the foodways system to ensure a holistic view of the system. In the end, we selected a cattle producer supplier, a direct-to-retail client and a direct-to-consumer client.

During the client selection process, we began to hypothesize that the closer the client's digital experience is to the consumer end product, the more volatile the consumer digital behavior would be in response to COVID-19. In other words, we reasoned that the direct-to-consumer digital traffic would be more reactive to the number of confirmed COVID-19 cases than the producer's digital traffic. Consumers who visited the direct-to-consumer website were demonstrating some level of purchase consideration since the product could be obtained directly from the client. On the other hand, the producer's product still had several processes to go through before arriving at a consumer's home.

OUR HYPOTHESES IN SUMMARY:

- **Hypothesis 1:** Digital traffic would be up year over year because of the acceleration of digital adoption.

- **Hypothesis 2:** There would be a statistically significant relationship between confirmed COVID-19 cases and digital traffic.

- **Hypothesis 3:** Consumer behavior would be more reactionary to COVID-19 cases/events the closer the digital experience is to the consumer end product.

The Johns Hopkins data set provided COVID-19 case counts from January 23 through mid-May. We opted to examine U.S. only, and we mirrored the date range and country criteria for all digital data. Initial results supported Hypothesis 1 with all three clients showing digital traffic growth year over year. The results also provided preliminary support for Hypothesis 3 with the growth in traffic increasing as clients' digital experiences near the consumer end product. Specifically, our producer's website traffic was up 14%, direct-to-retail was up 76%, and direct-to-consumer was up 313%. Note that some advertising tactics were running during the time frame.

Support for Hypothesis 2 and further support for Hypothesis 3 was discovered through a correlation and trend analysis. We found moderate significant relationships between COVID-19 confirmed cases and digital traffic by day for all three clients (r=0.388-0.602, p<0.001, n=112 days). In other words, on days with higher confirmed COVID-19 cases, on average, there was higher digital traffic. When the relationship was trended out, digital traffic was progressively more volatile as we moved through the foodways system. Our producer-supplier client saw a slight, steady increase in traffic throughout the COVID-19 time frame examined, our direct-to-retail client showed a few spikes in digital traffic during weeks with major COVID-19 news or events, and our direct-to-consumer client showed dramatic spikes throughout the timeline, likely in response to shifts in COVID-19 actuals, news and policies (i.e., stay-at-home orders).
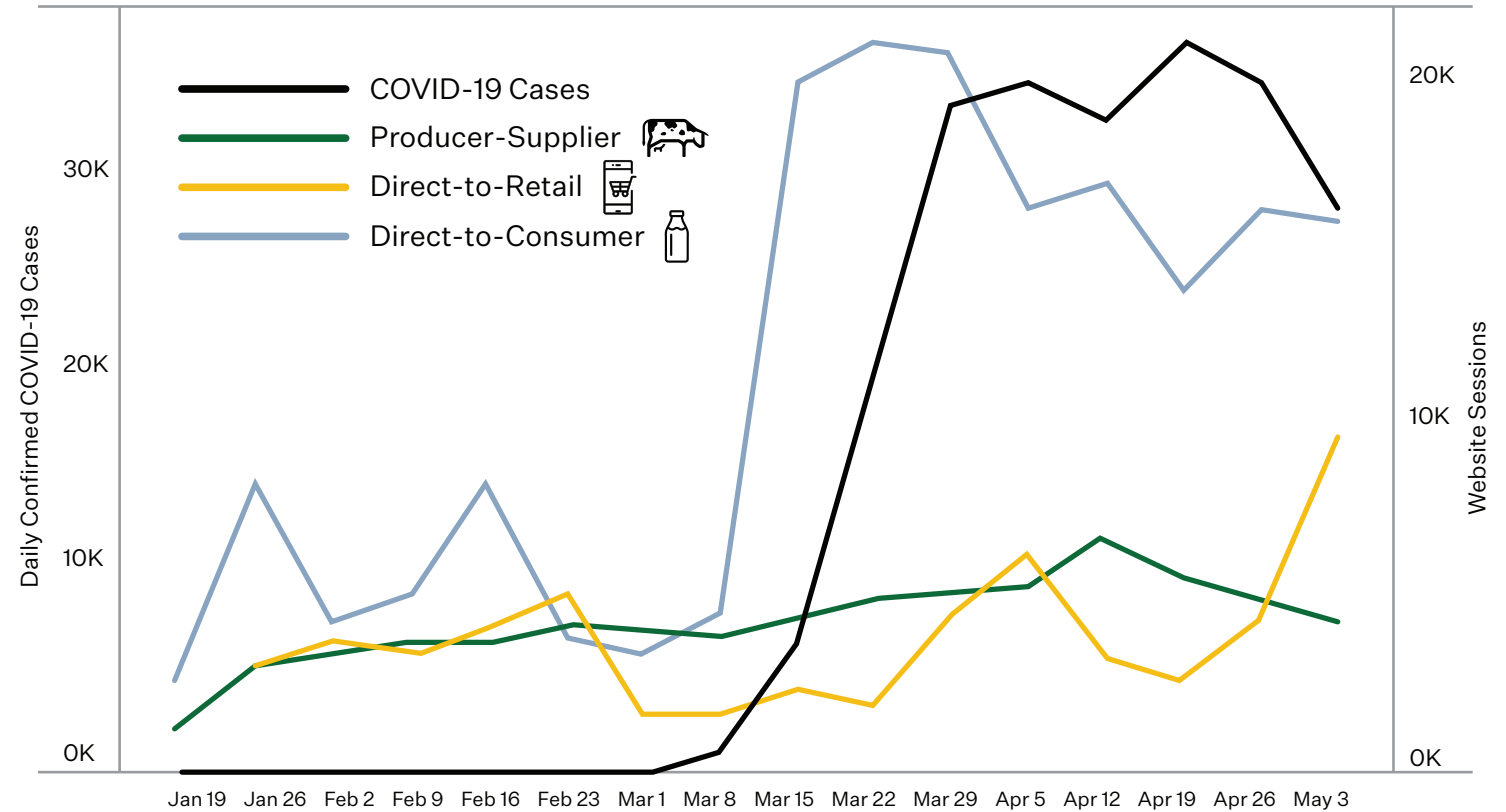
With this idea, we decided to also look into the impact on dine-in restaurant foot traffic in relationship to the increase in direct-to-consumer web traffic. We integrated year-over-year change in restaurant dine-in data from OpenTable (an online reservation network)[7] and found a stronger relationship between direct-to-consumer website traffic and the COVID-19 case timeline (r=-0.777, p<0.001, n=86 days). When stay-at-home orders were put in place, as indicated by the decline in dine-in customers as a proxy, website traffic spiked for our direct-to-consumer client. To summarize, consumer behavior signaled an increase in digital engagement during peak COVID-19 weeks, particularly for the brand with a more consumer-facing product.

The moderate to strong link between COVID-19 cases and direct-to-consumer digital behavior led us to further exploration of our direct-to-retail client. Specifically, we were curious if the relationship would be strengthened if we narrowed our focus from digital traffic to purchase intent behaviors. Consumers who visit the direct-to-retail site can demonstrate intent to purchase in a number of ways (e.g., by looking up grocery stores that sell the product). When reevaluating the relationship through the intent-to-purchase lens, we found that on days with more confirmed COVID-19 cases, on average, there were

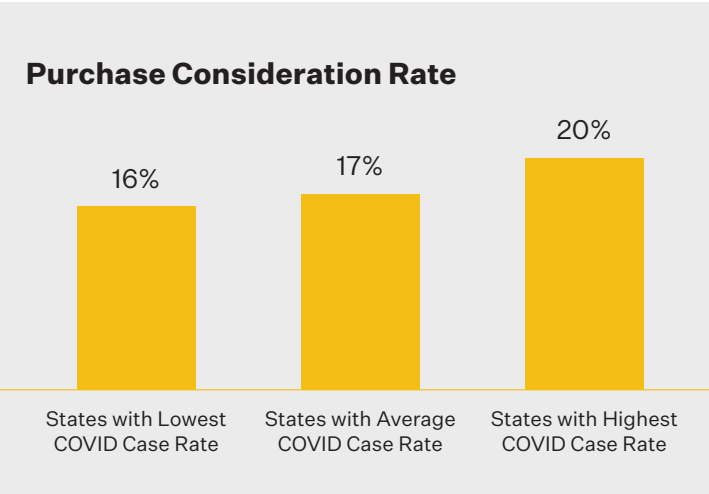Producer-Supplier   Direct-to-Retail   Direct-to-Consumer
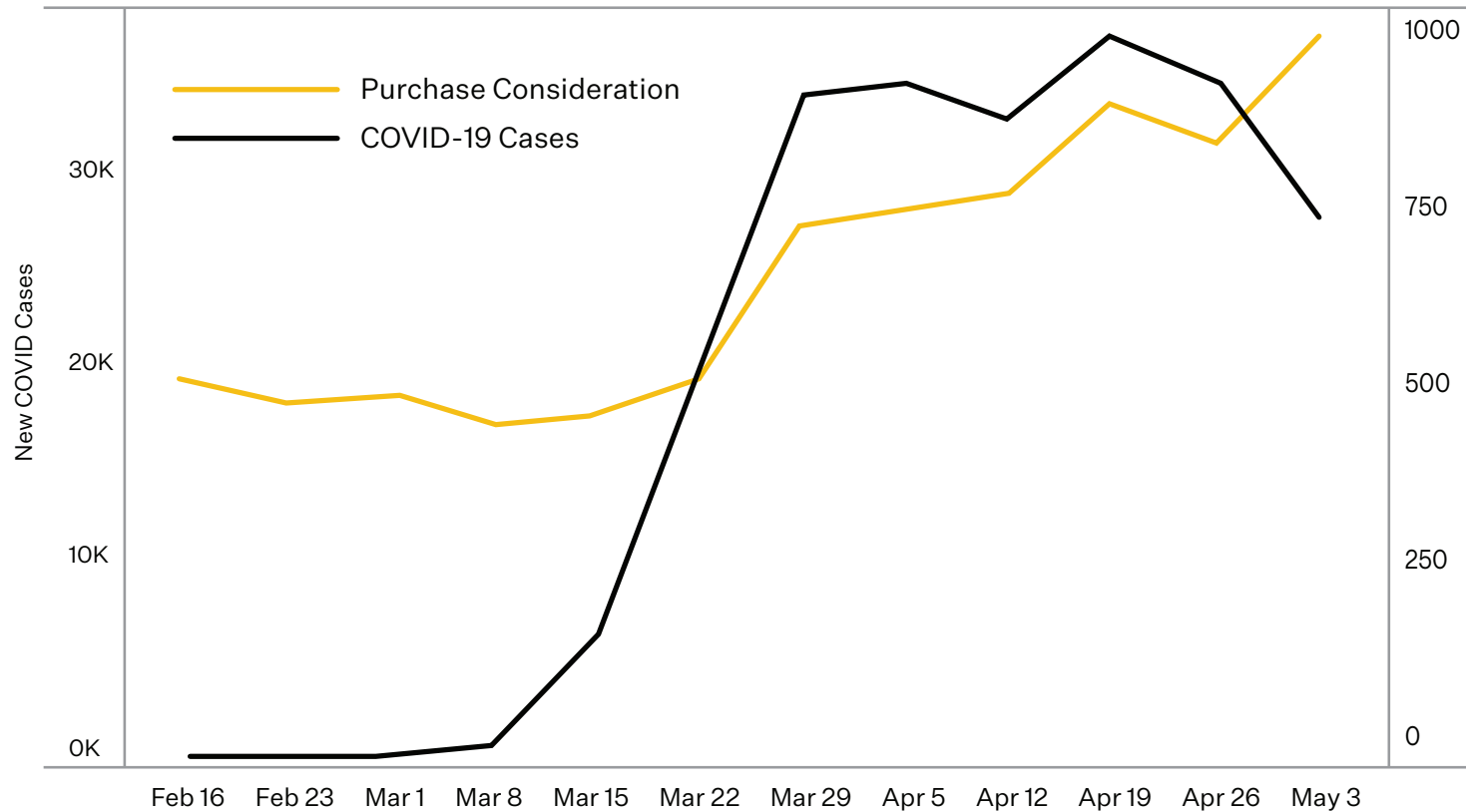
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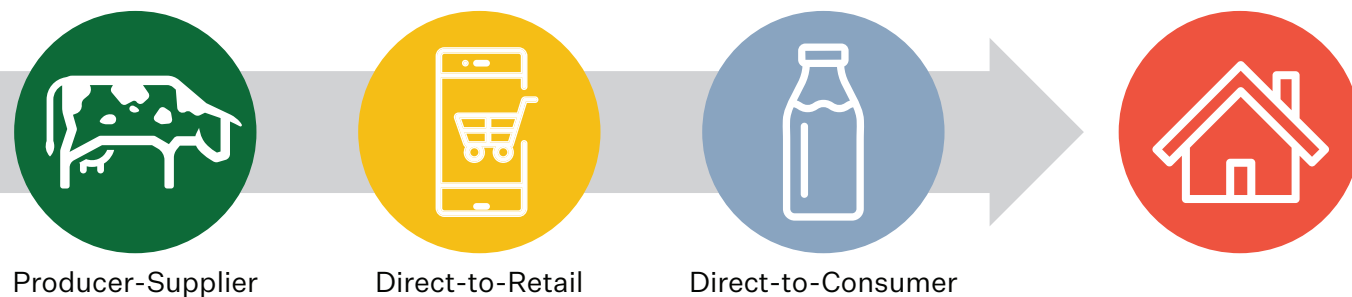
significantly higher amounts of intent to purchase behaviors (r=0.706, p<.001, n=112 days). This result provides further evidence in support of Hypothesis 3, as the direct-to-retail intent behaviors are similar along the path to purchase as direct-to-consumer overall website traffic.

Our final effort in this exploratory study was to evaluate the state-level relationship between COVID-19 cases and digital engagement. States have experienced the pandemic at varying levels of severity and have had a reasonable amount of jurisdiction over stay-at-home procedures and community guidelines. Therefore, we reasoned that in addition to a relationship to the COVID-19 timeline, we might find an effect at the state level. The direct-to-retail client was the best candidate for this analysis based on the

client's business model, and we used COVID-19 cases per million people to control for population density. At first glance, there was not a relationship between COVID-19 cases and website traffic. In fact, website traffic followed the client's standard geographic pattern outside of the pandemic, with traffic coming in from its largest markets. However, when we narrowed our focus to intent-to-purchase behaviors/traffic to control for market size, we discovered a significant correlation between cases per million people and intent to purchase rate (r=0.338, p=0.015, n=51). States with the highest saturation of COVID-19 cases per million had a 4%-point higher intent-to-purchase rate than those with the lowest saturation of COVID-19 cases, suggesting that consumers in states more affected by the pandemic may be looking to purchase at a higher rate.

Purchase Consideration Rate

States with Lowest COVID Case Rate	States with Average COVID Case Rate	States with Highest COVID Case Rate
16%	17%	20%

MEET THE CONSUMER IN THE DIGITAL SPACE AND BRACE FOR THE FUTURE

Returning to our original objective of exploring the impact of COVID-19 on our foodways system clients' digital engagement, results from our analysis point to a number of findings.

1. Digital traffic is up year over year for all three clients, but more so the closer the digital experience is to the consumer end product.

2. For the analysis time frame, there was a significant relationship between COVID-19 confirmed cases and digital traffic by day across clients.

3. Digital activity was more reactive to the pandemic the closer the digital experience is to the consumer end product.

4. Preliminary market-level results suggest that states with higher COVID-19 cases per million people also had higher percent of intent-to-purchase rates.

So what? Results suggest that brands within the foodways system are seeing positive growth in the digital space during COVID-19. These findings also suggest that consumers are still reliant on food brands, even those outside of traditional grocery, to meet their needs during this time. We saw that producer-suppliers are not experiencing digital change at the same rate as clients with consumer end products but ultimately may be impacted by plummeting prices for livestock.[8] Though speculative, brands supporting producers could experience a lag in the impact of COVID-19 as the supply chain disruption drives declining prices for producers. Finally, results suggest that direct-to-consumer brands may see more reactive consumer behavior to COVID-19 cases and news moving forward.

In total, the results of this exploration are meant to be directional and considered in addition to other information. An approach to specific strategy, messaging, operational shifts, budget allocation, etc., will be unique to every brand. However different each approach will be, at Signal Theory we build our brand strategies with a foundation of human-centered design and behavioral science. These strategies enable brands to meet their consumers' needs by meeting them where they are. Based on our data and exploration here, we developed a few recommendations as thought starters for brands:

1. As digital spaces have experienced the strains and stresses of increased traffic, and therefore scrutiny, now is a good time to evaluate ways to optimize your customer's journey and experience. The increase in traffic may enable you to identify opportunities to make the online experience more fluid to increase your customer's confidence that you understand them and will be a reliable ally in the future.

2. Future-proof your processes by removing barriers in the consumer journey. This is particularly important as accessibility to more traditional ways of shopping are restricted due to the pandemic. Consider how your brand could reallocate budget or resources, even temporarily, to meet customers where they are as they establish new routines and expectations. As the pandemic environment changes, stay in tune with your customers and ensure they know how your brand is changing to support them.

3. For brands that haven't yet seen the impact to their digital space, or for those in anticipation of further downstream impact, brace for similar patterns in digital behavior. Use this and other information available to you to best anticipate the needs of the consumer in the digital space and prepare your teams for what could be coming. Communicate with your customers about updates to your products and shopping options often so it's easy to do business with you.

Optimizing the digital experience and meeting the shifting needs of consumers during this time of uncertainty and consumer evolution are opportunities for brands to take a human-centered approach and build and fortify trust. Consumers are looking for stability during this tumultuous time, and brands have an opportunity to demonstrate that they're reliable, transparent and empathetic. Brands that seek to learn more about their consumers' state of mind during this ever-changing situation have a unique opportunity to improve lives while simultaneously nurturing their relationships.

Purchase Consideration
COVID-19 Cases

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About FoodThink from Signal Theory

Signal Theory is a brand development, marketing and design firm that creates resonance between people and brands. The firm's strategic framework pulls from many methods across the social sciences and consumer research, uncovering how people think, behave and make decisions. One of Signal Theory's core focus areas is food value chain marketing – promoting products all along the farm-to-table spectrum.

In late 2018, Signal Theory conducted the latest round of its FoodThink research study monitoring how consumers think about what they eat and America's relationship with food. After conducting its first study in 2012 as Sullivan Higdon & Sink, Signal Theory continues to monitor and research various food topics.

The study was executed among 2,123 consumers across the country via an online email survey (confidence interval of plus or minus 2.13% at a confidence level of 95%). Respondents had to be at least 18 years of age and have joint or primary responsibility for the grocery and food decisions in their household. They came from a mix of demographic backgrounds and regions across the U.S. The study covered a wide range of topics, such as perceptions of food production, trust in the food industry and brand perceptions. FoodThink was developed to help Signal Theory and its partners uncover insights about food in America in order to help craft effective marketing communications.

FOR MORE about FoodThink from Signal Theory, visit www.signaltheory.com/foodthink

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